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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/537,334	03/29/2000	Alexander C. Loui	79676DMW	6591

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EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/537,334	Applicant(s) LOUI ET AL.	
	Examiner Colin M. LaRose	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-17,20-24,26-28 and 30-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-17,26-28 and 33* is/are allowed.

6)☒ Claim(s) *3-7,20-24,30 and 32* is/are rejected.

7)☒ Claim(s) *31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12 and 14*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicants' amendments and arguments filed 26 April 2004, have been entered and made of record.

Information Disclosure Statement

2. The information disclosure statement filed 1 June 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Response to Amendments and Arguments

3. For claims 3, 4, 20, and 21, Applicant argues (page 14, paper 13) that Shimura does not disclose dividing the images into 3x3 or 4x4 blocks. In previous rejections, Examiner maintained that this feature was conventional in the art. U.S. Patent 6,400,853 by Shiiyama has been applied to show that it was conventional to divide an image into 3x3 blocks for the purposes of determining the similarity amongst images on the basis of the similarity between the blocks.

4. For claims 7, 24, and 30, Applicant argues (page 12, paper 13) that Shimura does not teach that two or more blocks would represent a foreground area in Shimura's images. However, Examiner asserts that dividing Shimura's images into a plurality of blocks, such as image 20

(figure 2), would produce at least two blocks that contain the foreground object. That is, if the image 20 is divided into a plurality of blocks, then at least two of the blocks will contain a portion of the leaf.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 3, 4, 7, 20, 21, 24, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,644,765 by Shimura et al. ("Shimura") in view of U.S. Patent 5,805,215 by Mizoguchi and U.S. Patent 6,400,853 by Shiiyama.

Regarding claims 3 and 20, Shimura discloses a method/computer program (figure 4) for detecting duplicate (i.e. substantially similar) images comprising the steps of:

providing at least two images captured at determinable times (figure 2: image 20 and database of images 33 are provided; figure 2, elements 43, 12, and 32 and column 4, lines 1-9: additional information, such as date and time of registration, is associated with each of the images);

computing an indication of image content for each image (figure 4, S17: image features relating to the content of each of the images are computed; e.g. figure 5, S30: feature extracted for image 20 and figure 3, S3: features extracted for database images 33);

determining the time of capture of each of the images (figure 4, S13: additional information (e.g. time of registration) is determined for each image); and

evaluating the indication of image content (figure 4, S18) and the time of capture (figure 4, S16) to determine whether the images are duplicate images (i.e. whether the images are substantially similar with regards to the content of the image blocks and the time of registration);

wherein the step of computing an indication of image content comprises:

dividing each image into blocks (column 3, lines 33-37);

and computing an indication of image content in each block (e.g. number of black pixels in each block).

Shimura teaches inputting the images using a scanner 11 (or the like), figure 1, and inputting the additional information 12, figure 1, of input images, such as the date of capture, using a keyboard.

Shimura is silent to using a photographic camera that records the time of capture.

Mizoguchi discloses a digital camera having the ability to store additional time data along with the images captured by the camera (1, figure 1). The time/date of capture is encoded in memory 51 (figure 10) with each image provided by the camera (column 6, lines 57-65). The date/time information is then used as criteria for retrieving images (column 8, lines 7-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura by Mizoguchi to utilize a Mizoguchi's photographic camera to input images and the time of capture of the images, since Mizoguchi's camera functions as an image input device in substantially the same fashion (i.e. to provide an electronic representation of an object) as Shimada's image input device 11, and Mizoguchi's camera eliminates the need for the user to manually input the time of capture of the image.

Shimura and Mizoguchi do not expressly disclose dividing the images into 4x4 or 3x3 blocks. However, at the time the invention was made, dividing an image into a small number of blocks and processing each block was common in the art and would have been an obvious modification to those skilled in the art.

As Shiiyama shows (figure 5), it is conventional to divide an image into 3x3 blocks for the purposes of determining the similarity between images.

Regarding claims 4 and 21, Shiiyama discloses utilizing 3x3 image blocks for similarity calculations (figure 5).

Regarding claims 7, 24, and 32, the combination of Shimura, Kim, and Shiiyama disclose two or more of the blocks represent a foreground area of the images (i.e. Shimura's images (e.g. 20, figure 2), when divided into 3x3 blocks, include at least two blocks that represent a foreground area); and

said computing further comprises computing an indication of image content in the foreground areas of each image (i.e. the images (20 and 33, figure 2) utilized by Shimura are essentially foreground objects; therefore, the indications of image content (column 3, lines 33-35: number of black pixels in each block) computed from the image blocks correspond to foreground areas).

7. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura in view of Mizoguchi.

Regarding claim 30, Shimura discloses a method (figure 4) for detecting duplicate (i.e. substantially similar) images comprising the steps of:

providing at least two images captured at determinable times from original scenes (figure 2: image 20 and database of images 33 are provided; figure 2, elements 43, 12, and 32 and column 4, lines 1-9: additional information, such as date and time of registration, is associated with each of the images and denote determinable times of capture);

computing an indication of image content for each image by dividing each image into blocks, computing an indication of image content in each block (e.g. number of black pixels in each block; column 3, lines 33-37), and comparing the computed indication of image content in each corresponding block for the two images to generate a similarity metric for each block (32, figure 5 and 52, figure 2: the corresponding blocks (i.e. the computed indications) of the images are compared to generate similarity metric);

determining the time of original capture of each of the images (figure 4, S13: additional information (e.g. time of registration) is determined for each image); and

evaluating the similarity metric for each block and the time of original capture (figure 4, S16 and S18) to determine whether the images are duplicate images (i.e. whether the images are substantially similar with regards to the content of the image blocks and the time of registration);

wherein the step of computing an indication of image content further comprises assigning two or more of the blocks represent a foreground area of the images (i.e. Shimura's images (e.g.

20, figure 2), when divided into a number of blocks, include at least two blocks that represent a foreground area); and

computing an indication of image content in each block and in the foreground areas of each image (i.e. the images (20 and 33, figure 2) utilized by Shimura are essentially foreground objects; therefore, the indications of image content (column 3, lines 33-35: number of black pixels in each block) computed from the image blocks correspond to foreground areas)

Shimura teaches inputting the images using a scanner 11 (or the like), figure 1.

Shimura is silent to using a photographic camera to capture the images.

Mizoguchi discloses a photographic camera having the ability to store additional time data along with the images captured by the camera (1, figure 1). The time/date of capture is encoded in memory 51 (figure 10) with each image provided by the camera (column 6, lines 57-65). The date/time information is then used as criteria for retrieving images (column 8, lines 7-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura by Mizoguchi to utilize Mizoguchi's photographic camera to input images and the time of capture of the images, since Mizoguchi's camera functions as an image input device in substantially the same fashion (i.e. to provide an electronic representation of an object) as Shimada's image input device 11, and Mizoguchi's camera eliminates the need for the user to manually input the time of capture of the image.

8. Claims 5, 6, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura in view of Mizoguchi, Shiiyama and U.S. Patent 6,445,818 by Kim et al. ("Kim").

Regarding claims 5 and 22, Shimura discloses the image feature comprises the number of black pixels in each block (column 3, lines 33-35). However, Shimura does not expressly disclose computing a histogram for each block.

Kim discloses a system for determining the content of an image so that an accurate search for the image can be performed. Kim teaches that a conventional method of determining an indication of the image content is to compute histograms for each block in an image. Figure 1C shows an image is first divided into blocks. Then, in figure 1D, a histogram is formed for each block, indicating the image content.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimura and Mizoguchi by Kim in order to compute a histogram for each block, since Kim teaches histograms are conventionally used to compute indications of image content in image blocks, and histograms are a means to determine the number of blacks pixels in each block.

Regarding claims 6 and 23, Shimura teaches comparing a block of one image (e.g. image 20), using the extracted feature, to a corresponding block of another image (e.g. an image in database 33) and using the time difference between capture of the two images to determine whether the images are duplicate images. Figure 4, S13: time information of the two images is compared; figure 4, S17: features of the two images are compared. Bother criteria are used to determine the similarity of the images.

With Kim's modification, the histograms of the two images are compared to determine similarity (column 2, lines 17-20). Kim does not expressly disclose the use of a histogram intersection metric to compare the histograms, however, using an intersection metric to the determine the similarity of two histograms was well-known and obvious to those skilled in the art. Official notice taken.

Allowable Subject Matter

9. Claim 31 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 33, 26, 27, and 28 are allowable because Shimura and Kim fail to disclose the claimed histogram intersection metric of claim 33.

Claims 8-17 are also allowable.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

CML
Group Art Unit 2623
9 July 2004